

Remarks

Claims 26 to 35 have been canceled without prejudice. Claims 24 and 25 were canceled without prejudice in a previous Amendment.

Claims 1-23 are before the Examiner for consideration.

Restriction Requirement

The Examiner states that Applicants' traversal with respect to claims 1-23 presented in the Amendment filed on July 24, 2009 was persuasive. In addition, the Examiner asserts that claims 26-35 are drawn to a different class and would require a different field of search.

In response, Applicants have canceled claims 26-35 without prejudice.

Rejection Under 35 U.S.C. §103(a)

Claims 1-23 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,670,255 to Temple, *et al.* ("Temple") or U.S. Patent No. 5,824,413 to Schell ("Schell"), each in view of U.S. Patent Publication No. 2004/0265586 to Gonthier, *et al.* ("Gonthier") and U.S. Patent No. 4,477,496 to Das, *et al.* ("Das"). The Examiner asserts that Temple teaches a glass strand coated with an aqueous composition that includes film formers such as polyesters, polyurethanes, vinyl polymers, and mixtures thereof. In addition, it is asserted that Temple teaches that the vinyl polymer can be polyvinyl acetate. With respect to Schell, the Examiner asserts that Schell teaches glass strands coated with an aqueous composition that includes a polyurethane. It is also asserted that Schell teaches that additional film formers such as polyester and vinyl polymers can be present in the composition. Further, the Examiner asserts that the vinyl polymer in Schell can be polyvinyl acetate. The Examiner admits that Temple and Schell do not teach the specific formation of the polyester polymer, the molecular weight of each component, or the specific amounts of each component.

In this regard, Gonthier is cited for assertedly teaching glass strands coated with an essentially aqueous sizing composition that includes a polyurethane and a polyester. It is asserted that the polyester is produced by the reaction of a carboxylic acid and/or anhydride and a polyol as is required by claim 3. Additionally, the Examiner asserts that the polyol can be a polyalkylene glycol and the anhydride can be maleic anhydride as required by claim 4. The Examiner admits that Gonthier is silent with respect to the molecular weight of the polyester.

Das is cited for assertedly teaching a sizing composition and glass fibers sized therewith that includes one or more crosslinkable film formers as the predominant amount of the solids, an aminosilane coupling agent, and an epoxidized thermoplastic copolymer. It is asserted that the epoxidized thermoplastic copolymer can be an epoxidized polyurethane and/or an epoxidized polyvinyl acetate.

The Examiner asserts that Temple, Schell, and Das each teach sizing compositions that include a polyester, a polyvinyl acetate, and a polyurethane. With respect to the amount of each film forming component, it is asserted that the prior art clearly teaches that sizing compositions including a combination of a polyester, a polyvinyl acetate, and a polyurethane are known. In addition, the Examiner asserts that Das teaches that it is desirable for the polyester to be present in predominate amounts. The Examiner also asserts that these teachings provide a suggestion to the skilled artisan to provide a sizing composition that contains a polyester as the predominate component. The Examiner further asserts that it is within the expected skill of one of ordinary skill in the art to arrive at the optimum proportion of the ingredients, and any improved results alleged by Applicant would have resulted from experimentation of an obvious nature.

Applicants' Response

In response to this rejection, Applicants respectfully direct the Examiner's attention to independent claims 1, 18, and 21 and submit that claim 1 defines a glass strand, claim 18 defines a sizing composition, and claim 21 defines a composite part that is not taught or suggested by Temple, Schell, Gonthier, and Das. In addition, Applicants respectfully submit that Temple, Schell, Gonthier, and Das do not teach or suggest the combination of features recited in claims 1, 18, and 21.

In the outstanding Office Action, the Examiner asserts that the prior art "clearly teaches that sizing compositions comprising a combination of a polyester, polyvinyl acetate and polyurethane are known". (See page 4, lines 17-29 of the Office Action dated May 4, 2010). Applicants respectfully disagree.

Applicants respectfully submit that none of Temple, Schell, Gonthier or Das teaches or suggests an aqueous sizing composition that includes 50 to 80% of at least one polyester, 10 to 40% of at least one polyvinyl acetate, and 8 to 15% of at least one polyurethane as required by claims 1, 18, and 21. Looking first at Temple, Applicants acknowledge a general disclosure within Temple of a polyester, a polyurethane, and polyvinyl acetate. It is respectfully submitted, however, that one of skill in the art would have no reason, based on

the teachings of Temple, to choose these three particular film forming materials from the extensive list of film forming agents recited in Temple for use in a sizing composition. Applicants respectfully submit that the claimed polyester, polyurethane, and polyvinyl acetate cannot simply be selected from such an extensive and virtual endless laundry list of potential film formers. Indeed, there must be some suggestion or motivation provided within the reference for one of skill in the art to select the particular components.

It is respectfully submitted that simply placing polyesters, polyurethanes, and polyvinyl acetate in a list of potential film forming materials does not provide motivation for one of skill in the art to choose one particular polymer over another. (*See, e.g., Manual of Patent Examining Procedure*, Patent Publishing, LLC, Eighth Ed., Rev. 6, August 2007, §2144.08). Applicants submit that polyesters, polyurethanes, and polyvinyl acetate are cited in the exemplary list of film formers in Temple without any teaching of desired or advantageous features that may be or are provided by selecting and utilizing polyesters, polyurethanes, and polyvinyl acetate in combination as is required by claims 1, 18, and 21. One of skill in the art reading Temple has no reason to select the claimed film forming agents from the list within Temple.

Additionally, Applicants note that the Examiner cites column 15, lines 39-43 of Temple for teaching that suitable film formers include polyesters, polyurethanes, and vinyl polymers. It is respectfully submitted that this cited disclosure in Temple discloses suitable film forming materials as “starches, cellulosic materials, thermoplastic materials, thermosetting materials, and mixtures thereof.” (*See* column 15, lines 39-43). As discussed in detail above, one of skill in the art has no reason to select a polyester, a polyurethane, and a polyvinyl acetate as the film forming materials based on such a general disclosure. It is respectfully submitted that such a combination can only be gleaned from Applicants’ disclosure, which is an impermissible use of hindsight. As discussed above, one cannot simply pick and choose elements (*e.g.*, film forming agents) from a reference without some teaching or suggestion or some motivation to select the particular components. It is respectfully submitted that there is no teaching or motivation provided within Temple to lead one of skill in the art to choose the three claimed film forming agents for use in a sizing composition.

Applicants respectfully submit that there is no teaching within Das of the claimed film forming agents. In the outstanding Office Action, the Examiner asserts that Das teaches a polyester and an epoxidized polyurethane and/or an epoxidized polyvinyl acetate. (*See* page

4, lines 8-10 of the Office Action dated May 4, 2010). Applicants agree, in part, with the Examiner's assertion.

Applicants assert that Das teaches the use of a water solubilized, crosslinkable, unsaturated polyester resin and a water dispersible unsaturated polyester resin as the crosslinkable film formers. (*See, e.g.* column 10, lines 24-48 and column 13, lines 40-48). There is, however, no teaching or suggestion within Das of a polyurethane or a polyvinyl acetate film forming agent. Das clearly teaches the use of an epoxidized thermoplastic polymer to form an interaction product with an aminosilane coupling agent. (*See, e.g.* column 7, lines 53-58 and column 13, lines 40-61). Thus, the epoxidized thermoplastic polymer (*e.g.*, epoxidized polyurethane and/or an epoxidized polyvinyl acetate) is *not* a film forming agent. Accordingly, Das fails to teach the combination of film forming agents required by claims 1, 18, and 21. Indeed, Das is silent regarding any teaching or suggestion of the claimed combination of film forming agents.

Gonthier teaches the use of a polyurethane and a polyester in a sizing composition in a specific ratio, and does not mention the use of polyvinyl acetate. Applicants submit that there is absolutely no teaching or suggestion within Gonthier of the use of a polyurethane, a polyester, and polyvinyl acetate as film forming agents. In fact, Gonthier is silent regarding any teaching or suggestion of polyvinyl acetate. Accordingly, Gonthier does not teach or suggest the claimed film forming agents.

In view of the above, it is respectfully submitted that Temple, Gonthier, and Das do not teach or suggest the claimed film forming agents. In particular, Applicants respectfully submit that Temple, Gonthier, and Das do not teach or suggest a sizing composition that includes at least one polyester, at least one polyurethane, and at least one polyvinyl acetate as required by claims 1, 18, and 21. Temple simply does not provide guidance for one of skill in the art to pick and choose from among the extensive list of film forming agents, and Das and Gonthier do not provide any assistance to one of skill in the art to arrive at sizing compositions claimed in claims 1, 18, and 21. Accordingly, it is respectfully submitted that claims 1, 18, and 21 are non-obvious and patentable for at least this reason.

In the outstanding Office Action, the Examiner also asserts that given that the combination of film formers was known, it is within the skill of one in the art to arrive at the optimum proportion of the ingredients. (*See* page 5, lines 1-9 of the Office Action dated May 4, 2010). Applicants respectfully disagree.

Notwithstanding that the cited art does not teach or suggest the claimed combination of film formers as discussed above, Applicants respectfully submit that there is no teaching or suggestion of the claimed ranges for the polyester, polyurethane, and polyvinyl acetate recited in claims 1, 18, and 21 within Temple, Gonthier, and Das, nor would one of skill in the art arrive at the claimed amounts through routine experimentation. Applicants note that Temple teaches that the total amount of film forming material can be from about 0.0001 to about 99.1 weight percent of the curable composition on a solids basis. (*See, e.g.* column 18, lines 1-2). It is respectfully re-submitted that a teaching “from about 0.0001 to 99.1 weight percent” of a film forming material is simply not a sufficient teaching for one of skill in the art to arrive at the claimed ranges for the polyester, polyurethane, and polyvinyl acetate.

Additionally, Applicants submit that Temple teaches that the preferred ranges for the total amount of film forming materials are from about 0.01 to about 50 weight percent and from about 0.0.1 to about 10 weight percent. (*See, e.g.*, column 18, lines 3-5). Thus, in Temple, the film former is preferably present in an amount less than 50 weight percent. These preferred ranges may be contrasted to the claimed ranges, where, at a minimum, the film forming agents are present in the sizing composition in an amount of 68% by weight of the solid material (*i.e.*, 50% polyester + 10% polyvinyl acetate + 8% polyurethane). Applicants respectfully submit the teaching of preferred ranges within Temple would lead one of skill in the art away from ranges that would create a film forming material that is present in an amount greater than 50 weight percent, such as is required by claims 1, 18, and 21. Accordingly, Applicants respectfully submit that Temple actually teaches away from the inclusion of the claimed film forming agents in the claimed amounts.

Further, Applicants submit that even if one of skill in the art were to look elsewhere for guidance, such as to Gonthier and/or Das, one of skill would still not arrive at the inventions claimed in claims 1, 18, and 21. For example, in Gonthier, the polyester and polyurethane film formers are present in the composition in a maximum amount of 10.85% by weight. (*See, e.g.* paragraphs [0048]-[0053]). Das teaches the use of from about 1 to about 12 weight percent of a water solubilizable unsaturated polyester resin and about 2 to about 12 weight percent of a water dispersible unsaturated polyester resin. (*See, e.g.* column 13, lines 40-45). Thus, Das teaches a maximum amount of 24 weight percent for the crosslinkable film forming material. These amounts are a far cry from the claimed 50 to 80% of at least one polyester, 10 to 40% of at least one polyvinyl acetate, and 8 to 15% of at least one polyurethane. It is respectfully submitted that Gonthier and Das do provide any

assistance or guidance to one of skill in the art to arrive at the claimed sizing composition. It is respectfully submitted that Gonthier and Das simply do not teach or suggest the claimed ranges, and as such, cannot make up for the deficiencies of Temple. Thus, Applicants submit that the combination of the cited references would not result in the claimed sizing composition.

Also, the Examiner asserts that Das teaches that the polyester can be present in predominant amounts, which provide a suggestion for the skilled artisan to provide polyester as the predominate component. (*See, e.g.* page 4, line 20 to page 5, line 1 of the Office Action dated May 4, 2010). In response, Applicants respectfully submit that Das teaches that the crosslinkable film forming polymers “are present in the aqueous sizing composition as the predominant amount of the solids of the sizing composition”. (*See* column 4, lines 44-47). Reading Das, it can be seen that the “predominant” amount is indeed an amount greater than the remainder of the sizing constituents; however, the film forming agents are only present in amounts up to about 24 weight percent. (*See, e.g.* column 13, lines 40-48). A “predominant amount”, as taught by Das, is one that is greater in proportion compared to the other components, not one that is greater than 50%. As such, Applicants respectfully submit that Das provides no teaching for one of skill in the art to include a polyester in an amount greater than 50%, let alone to utilize three separate film forming agents in amounts of 50 to 80%, 10 to 40%, and 8 to 15% as required by claims 1, 18, and 21.

It is respectfully submitted that not only do the cited references not teach or suggest the claimed film forming agents; they do not teach or suggest the claimed amounts of each of the film forming agents. Thus, contrary to the Examiner’s assertion that arriving at the optimum proportion of the ingredients would have been within the expected skill of one of the art because the ingredients were known, the references do not teach or suggest the claimed film forming agents, and one of skill in the art could not arrive at the claimed ranges. Moreover, Applicants respectfully submit that the claimed ranges cannot be obtained by routine experimentation given the virtual endless combination of ranges possible for each film former and the teachings within the cited art of ranges that fall far outside of the claimed ranges. In addition, the art cited by the Examiner does not lead one of skill in the art to experiment with larger amounts of film forming agents because the art clearly teaches amounts of film forming agents in amounts less than 50%. Accordingly, it is respectfully submitted that claims 1, 18, and 21 are non-obvious and patentable over Temple, Gonthier, and Das for these additional reasons.

Turning to Schell, Applicants respectfully submit that Schell teaches an aqueous secondary coating that includes a urethane-containing polymer in an amount from about 1 to about 60 weight percent of the coating composition and one or more film forming materials in an amount from about 1 to about 20 weight percent of the coating composition on a total solids basis. (*See, e.g.*, column 4, lines 4-6; column 5, lines 4-8; and column 9, lines 52-55). These teachings of Schell may be contrasted to the claimed invention where the film forming adhesion agents of the sizing composition include 50 to 80% of at least one polyester, 10 to 40% of at least one polyvinyl acetate, and 8 to 15% of at least one polyurethane. Assuming, *arguendo*, that the “additional” film forming materials of Schell include a polyester and a polyvinyl acetate, there is still *no way* that Schell can include a polyester in an amount from 50 to 80% by weight of the total solids as is required by claims 1, 18, and 21. Indeed, Schell specifically and clearly teaches that the other film forming agents (*i.e.*, film formers other than polyurethane, such as polyester) are present in the composition in an amount from about 1 to about 20%. There is simply no teaching or suggestion anywhere within Schell of including a polyester in an aqueous sizing composition in an amount from 50 to 80% by weight as claimed in claims 1, 18, and 21. As discussed above, Gonthier and Das do not teach or suggest the claimed film formers or the claimed ranges, and as such, cannot make up for the deficiencies of Schell. Accordingly, it is respectfully submitted that the combination of Schell, Gonthier, and Das would not result in the inventions of claims 1, 18, and 21. Therefore, Applicants respectfully submit that claims 1, 18, and 21 are non-obvious and patentable over Schell, Gonthier, and Das for at least this reason.

Further, Applicants submit that there is no motivation for one of skill in the art to arrive at the glass strand claimed in claim 1, the sizing composition claimed in claim 18, or the composite part claimed in claim 21 based on the disclosures of Temple or Schell with Gonthier and Das. To establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, and the prior art reference (or references when combined) must teach or suggest all the claim limitations. (*See, e.g., Manual of Patent Examining Procedure*, Patent Publishing, LLC, Eighth Ed., Rev. 7, August 2008, §2143 citing *KSR International Co. v. Teleflex Inc.*, 550 U.S.398, 82 USPQ2d 1385 (2007)).

It is respectfully submitted that one of ordinary skill in the art would not be motivated to arrive at an aqueous sizing composition that includes 50 to 80% of at least one polyester,

10 to 40% of at least one polyvinyl acetate, and 8 to 15% of at least one polyurethane based on the teachings of Temple or Schell in combination with Gonthier and Das because there is simply no teaching or even a suggestion within Temple, Schell, Gonthier, or Das of the inclusion of the claimed film forming agents in the claimed amounts in a sizing composition, as is discussed in detail above. Without some teaching or suggestion, there can be no motivation, and without motivation, there can be no *prima facie* case of obviousness.

In addition, because Temple, Schell, Gonthier, and Das do not teach or suggest a sizing composition that includes 50 to 80% of at least one polyester, 10 to 40% of at least one polyvinyl acetate, and 8 to 15% of at least one polyurethane, Applicants respectfully submit that Temple, Schell, Gonthier, and Das, alone or in any combination, fail to teach all of the claim limitations set forth in claims 1, 18, and 21. Therefore, it is submitted that a *prima facie* case of obviousness has not been established for this additional reason.

In view of the above, it is respectfully submitted that independent claims 1, 18, and 21 are not taught or suggested by Temple or Shell with Gonthier and/or Das and that claims 1, 18, and 21 are therefore non-obvious and patentable. With respect to dependent claims 2-17, 19-20, and 22-23, Applicants submit that because independent claims 1, 18, and 21 are not taught or suggested by Temple or Shell in combination with Gonthier and/or Das and because claims 2-17, 19-20, and 22-23 are dependent upon one of claim 1, claim 18, or claim 21 and contain the same elements as the claim from which they depend, dependent claims 2-17, 19-20, and 22-23 are also not taught or suggested by Temple or Shell in combination with Gonthier and/or Das.

In light of the above, Applicants submit that 1-23 are not obvious over Temple or Shell in combination with Gonthier and/or Das and respectfully request that the Examiner reconsider and withdraw this rejection.

Conclusion

In light of the above, Applicants believe that this application is now in condition for allowance and therefore request favorable consideration.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

If necessary, the Commissioner is hereby authorized to charge payment or credit any overpayment to Deposit Account No. 50-0568 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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